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Government
Publications

DEPARTMENT OF ENERGY, MINES AND RESOURCES
Ottawa



GULF OF ST. LAWRENCE

November 14 to November 24, 1968

No. 11

1969 Data Record Series

Canadian Oceanographic Data Centre

Programmed by the
Canadian Committee on Oceanography

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1969

GULF OF ST. LAWRENCE

November 14 to November 24, 1968

CODC Reference: 10-68-004

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1969 Data Record Series

DEPARTMENT OF ENERGY, MINES AND RESOURCES
Canadian Oceanographic Data Centre
615 Booth St., Ottawa, Canada

Programmed by the Canadian Committee on Oceanography

DEPARTMENT OF ENERGY, MINES AND RESOURCES
and
FISHERIES RESEARCH BOARD OF CANADA

GULF OF ST. LAWRENCE

Ship: CNAV "Sackville"
Local cruise designation: BI 6268
CODC cruise reference no: 10-68-004
Cruise period: November 14 - November 24, 1968
Officer-in-Charge: T.R. Foote
Observers: E.F. MacDonald
E.A. Verge
W.G. Warshick
A.E. Swyers
D. Strong

ATLANTIC OCEANOGRAPHIC LABORATORY
and
MARINE ECOLOGY LABORATORY

Bedford Institute, Dartmouth, N.S.

SECTION I

Description of data collection procedures

"SACKVILLE"
CANTRELL, CALDWELL & CO. LTD.



Fisheries Research Board

GULF OF ST LAWRENCE ICE FORECAST CRUISE BI 6268 SACKVILLE

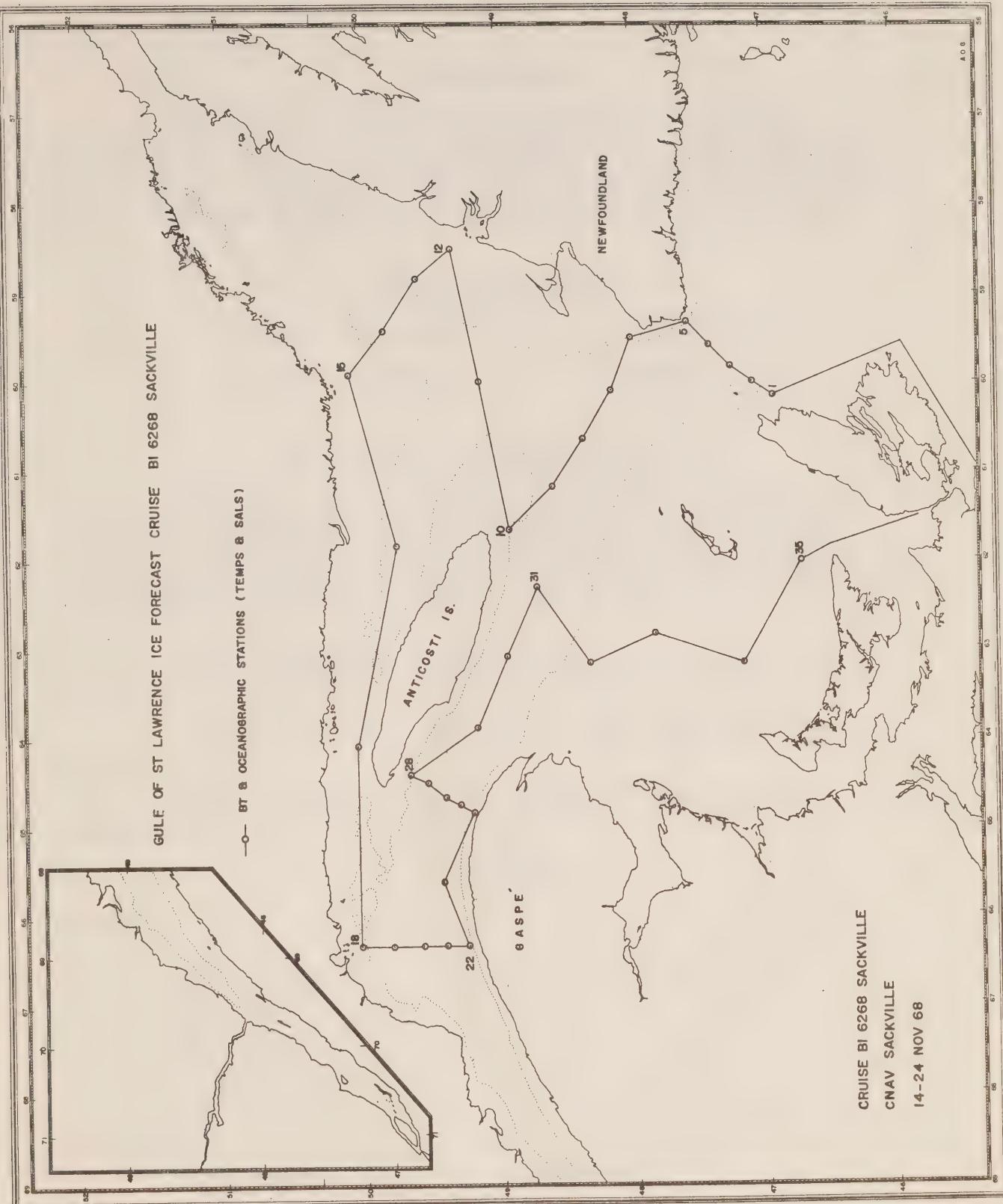
—○— BT & OCEANOGRAPHIC STATIONS (TEMPS & SALTS)

ANTICOSTI I.

GASPE'

NEWFOUNDLAND

CRUISE BI 6268 SACKVILLE
CNAV SACKVILLE
14-24 NOV 68



INTRODUCTION

The purpose of the cruise was to sample temperatures and salinities in the upper 250 metres at representative stations throughout the Gulf of St. Lawrence, and thus to provide temperature and salinity data with which the Ice Forecast Central office of the Department of Transport prepare their ice forecast for the 1968-69 winter season in the Gulf.

EXTRACT OF CRUISE LOG

Depart	Dartmouth, N.S.	-	14 November 1968
Arrive	Dartmouth, N.S.		24 November 1968

OBSERVATIONAL AND LABORATORY PROCEDURES

Temperature and salinity data were collected in single casts at 35 stations throughout the Gulf of St. Lawrence. Standard sampling procedures to depths were used with an additional depth at 40 metres, as requested by Ice Central. Two protected Richter & Wiese thermometers were used on Knudsen-type sampling bottles. Bathythermograph lowerings were made just prior to the oceanographic casts.

Water samples were measured for salinity, on board, by the conductivity bridge method (Auto Lab Salinometer).

Weather observations were made at each oceanographic station by the ship's officers.

Bathythermograph slides and records were forwarded to the Canadian Oceanographic Data Centre for processing.

PERSONNELAt sea:

T.R. Foote
 E.F. MacDonald
 E.A. Verge
 W.G. Warshick
 A.E. Swyers
 D. Strong

Officer-in-Charge

Data Analyses

Compilation of data:	T.R. Foote
Salinity determinations	E.F. MacDonald
BT processing	CODC

SECTION II

Description of the machine-generated data record

INTRODUCTION

This section applies to the machine processing phase of the data reduction and computation.

The oceanographic data previously recorded on CODC data summary forms, a sample of which is shown on the next page, are transferred to punch-cards for subsequent electronic data processing on an IBM 1620 computer, using CODC's OCEANS II program. In addition to computing routine derived quantities, the program carries out unit and format conversions, range checks, plausibility tests, internal editing, and if required, interpolation at standard oceanographic depths. When interpolations are carried out, additional derived values are computed.

After the data have been processed, the data record is prepared using an IBM 1401 computer configuration with the OCEAN REPORT III program, which provides for pre-edited high speed print-out on continuous direct-image masters. These masters subsequently yield the required volume of copies for distribution.

Provision has been made to enter an "estimate of precision" for each observed variable selected for interpolation at standard oceanographic depths. The precision depends on the instrument and/or technique used to determine the variable. A standard precision stated as a **standard deviation** (σ) can be determined for each instrument or technique under routine field conditions by making duplicate determinations of the variables for a homogeneous sample of sea water. These standard deviations are given for each cruise under "GENERAL INFORMATION" in section III of the data record.

The **measurement error estimate** of a specific observation in this data record, is stated as a multiple of the standard deviation derived as above, and entered in a column immediately to the right of the reported variable. In order to distinguish it from an additional decimal digit, the measurement error estimate is recorded alphabetically, (i.e., $1\sigma = A$, $2\sigma = B$, etc.; in this data record "A" is suppressed).

An option is provided with respect to the measurement of the salinity variable. If observed to three decimal digits, the last digit takes the place of the measurement error estimate.

In the past, a number of methods for both manual and machine interpolation have been developed. Studies and comparisons of the several methods have shown that no single method is universally acceptable. The manual methods are the most elaborate and flexible, but often require subjective decisions. In machine interpolation, all the present methods fail to yield acceptable results under some circumstances. Hence, it is considered necessary to qualify interpolated values by stating an "interpolation error estimate" derived from the particular interpolation formula used. There are two purposes in stating the error estimates; first, to give an indication of the quality of the interpolated data; second, to allow the oceanographer to redesign his observational procedures in order to reduce interpolation errors in future observations.

The interpolation scheme chosen for the OCEANS II program consists of a combination of two 3-point interpolations using the Lagrangian interpolation polynomial, as recommended by Rattray (1962). A parabola is fitted through three values of a given variable (T, S, O₂) considered as a function of depth. The two interpolation parabolas require a total of four points (observed depths). The middle points are common to both parabolas. The average of the two values obtained from the parabolas at standard depth is taken as the interpolated value, and a function of their difference as an estimate of the interpolation error.

This function combined with the "measurement error estimate" comprises the "combined measurement and interpolation error estimate". It is expressed as a multiple of the standard deviation of measurement (σ) under normal routine field conditions by:

CANADIAN OCEANOGRAPHIC DATA CENTRE

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$$\frac{\sigma_i}{\sigma} = \left\{ \left(\frac{(\Delta V_i)^2}{\sigma^2} + \sum_{n=j-2}^{j+1} (\gamma_n)^2 \left(\frac{\sigma_n}{\sigma} \right)^2 \right) \right\}^{1/2} \quad , \text{ where}$$

σ = Standard deviation of the combined error estimates at standard oceanographic depth,
 ΔV_i = the interpolation error estimate of variable "V" at standard oceanographic depth = $^{1/3} (V_{i_1} - V_{i_2})$
 γ = Interpolation polynomial coefficient.

Z_j = Observed depth.

Z_i = Standard oceanographic depth, such that: $Z_{j-2} < Z_{j-1} < Z_i < Z_j < Z_{j+1}$

The integral part of the fraction $\frac{\sigma}{\sigma}$, if ≥ 2 , is reported in this Data Record following the interpolated variable. It represents the combined measurement and interpolation error estimate. In order to distinguish it from an additional decimal digit, it is recorded alphabetically (e.g.: 2 as "B", 3 as "C", etc.).

With respect to the interpolated value of the salinity variable if reported to three decimal digits, the interpolation error estimate is given only when $\frac{\sigma}{\sigma} \geq 2$ (the salinity is then recorded to two decimal places). If less than 2, the mean obtained from the two interpolation parabolas is reported to three decimal places.

EXPLANATION OF DATA RECORD HEADINGS

MASTER HEADINGS

(1) C-REF-NO	(6) YR	(11) DEPTH	(16) WAVES 1	(21) AIR T	(26) VIS
(2) CONS. NO	(7) MONTH	(12) MXSAMPD	(17) WAVES 2	(22) WET B	(27) STN
(3) LAT	(8) DAY	(13) NO. DPTH	(18) WND-DIR	(23) WW-CODE	
(4) LON	(9) HR	(14) W-COLOR	(19) WND-FCE	(24) CLD-TPE	
(5) MARSD SQ	(10) C/I	(15) W-TRNSP	(20) BARO	(25) CLD-AMT	(28) HW

(1) CRUISE REFER-
ENCE NUMBER: Assigned by the Institute. Commences with 001 at the beginning of each year (effective Jan. 1, 1963). Prior to that date the CRN was a number designated by CODC.

(2) CONSECUTIVE
NUMBER: Indicates the chronological order in which the stations were occupied.

(3) LATITUDE:
Indicate the position of the platform at the time of observation.

(4) LONGITUDE:

(5) MARSDEN SQUARE: Designates the geographic area code of the observation (see Marsden square chart).

(6) YEAR:

(7) MONTH:

(8) DAY:

(9) HOUR: The time (Greenwich Mean Time) at which the surface environmental data were recorded. It is reported to tenths of hours (Table 1). If an "X" precedes the value for HOUR, (prior to Jan. 1, 1963) it indicates that the reported time is doubtful.

(10) COUNTRY/
INSTITUTE: The International Geophysical Year (IGY) Country Code/Institute Code - see Table 11.

(11) DEPTH: The sounding reported in metres. If corrected, this is stated in the "GENERAL INFORMATION" chapter of section III. Charted depths are preceded by the letter "C".

(12) MAXIMUM
SAMPLING DEPTH: A code to indicate the deepest sampling depth (used for high speed sorting).
00 m - 50 m = 00
51 m - 150 m = 01
151 m - 250 m = 02
etc.

(13) NUMBER OF

DEPTHS:

The number of levels observed (this is entered to initiate a computer safety check, guarding against the loss of punch-cards).

(14) WATER COLOUR:

A code based on the percentage of yellow (see table 2 and Note under FIELD "15" below).

(15) WATER

TRANSPARENCY:

The depth in metres at which a Secchi disc (white disc, 30 cm. in diameter) just disappears from view, or the optical density expressed in percentage;

NOTE: The "GENERAL INFORMATION" chapter in section III of the data record will state which method was used.

(16) WAVES 1

(d_w d_w P_w H_w-code):

The direction, period and height of the wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Codes 0885, 3155, 1555.

(17) WAVES 2

(d_w d_w P_w H_w-code):

The direction, period and height of the predominant non-wind-propagated wave system. (See Tables 3, 4 and 5). Ref: World Meteorological Organization Codes 0885, 3155, 1555.

(18) WIND DIRECTION:

The true direction to the nearest 10 degrees from which the wind is blowing (wind direction 990 means:-wind variable or direction unknown).

(19) WIND FORCE

(WND-FCE):

Beaufort notation (See Table 6).

WIND SPEED

(WND-SPD):

Anemometer reading reported in metres per second. Instrument height reported in "GENERAL INFORMATION" chapter of section III.

(20) BAROMETER:

The barometric pressure reported in millibars: the "GENERAL INFORMATION" chapter in Section III of the data record will state the type of instrument used.

(21) AIR

TEMPERATURE:

In degrees Celsius.

(22) WET BULB:

In degrees Celsius.

(23) ww CODE:

Present Weather Code (See Table 7). Ref: WMO Code 4677

(24) CLOUD TYPE:

The type of predominating clouds (See Table 8). Ref: WMO Code 0500.

(25) CLOUD AMOUNT:

The sky coverage in eighths (See Table 9) Ref: WMO Code 2700

(26) VISIBILITY:

Visibility at the surface (See Table 10). Ref: WMO Code 4300.

(27) STATION:

A station reference number, assigned by the institute prior to, or during the survey.

OBSERVED DATA HEADINGS

(1) <i>GMT</i>	(2) <i>DEPTH</i>	(3) <i>TEMP</i>	(4) <i>SAL</i>	(5) <i>OXYGEN</i>	(6) <i>SGMT</i>
(7) <i>SOUND</i>	(8) <i>PO₄</i>	(9) <i>-P-</i>	(10) <i>NO₂</i>	(11) <i>NO₃</i>	(12) <i>SiO₃</i>
					(13) <i>pH</i>

NOTE: Headings (1) to (7) will always be present. Headings (8) to (13) appear only when one or more additional chemical entries were made.

(1) **G.M.T.:** The Greenwich Mean Time of (in-situ) thermometer inversion and sea water sample collection.

When a multiple cast was initiated prior to and continued after midnight, the times indicated are uninterrupted by the change of day and appear beyond 24.0 hours. This will be accompanied by a statement: "MULTIPLE CAST CONTINUED NEXT DAY", which is printed following the last level of observed values.

(2) **DEPTH:** The depth in metres at the reversal time of deepest cast.

(3) **TEMPERATURE:** Temperatures from deepsea reversing thermometers, read to 0.01° C. Surface temperature measurement procedures are described in the chapter "OBSERVATION PROCEDURES" of section I, and/or the "GENERAL INFORMATION" chapter of section III. An alphabetical character following the temperature value represents the measurement error estimate referred to in the INTRODUCTION to this section.

(4) **SALINITY:** Salinity as defined by: $S = 0.03 + 1.805 C1\%$, reported in:
 a. 1/100 parts per 1000, or
 b. 1/1000 parts per 1000.

In case a: an alphabetical character following the value is the measurement error estimate as referred to under (3).

In case b: no error estimate indication is provided for, but an additional decimal digit takes its place.

(5) **OXYGEN:** The concentration of dissolved oxygen expressed in millilitres per litre to 2 decimal places.
 An alphabetical character following the value is the measurement error estimate as referred to under (3).

(6) **SIGMA-T:** The specific gravity anomaly as defined by: $(\text{Specific gravity} - 1) \times 10^3$ (e.g., σ_t reported as 2456, reads 24.56, and corresponds to a specific gravity of 1.02456).

(7) **SOUND:** The sound velocity is reported in m/sec. to 1 decimal place (e.g., 1437.9 m/sec.). The computation is carried out using Wilson's formula (1960), expressed in terms of temperature, salinity and total pressure.

(8) PO ₄	Phosphate-Phosphorus reported to hundredths of microgram-atoms per litre.
(9) -P-	Total Phosphorus reported to hundredths of microgram-atoms per litre.
(10) NO ₂	Nitrite-Nitrogen reported to hundredths of microgram-atoms per litre — No dissolved nitrogen included —
(11) NO ₃	Nitrate-Nitrogen reported to tenths of microgram-atoms per litre.
(12) SiO ₂	Silicate-Silicon reported in whole microgram-atoms per litre.
(13) pH	The pH value.

NOTE: "TRC" (trace) is reported when a chemical entry has a value less than the standard deviation of measurement for that particular variable.

INTERPOLATED DATA HEADINGS

(1) DEPTH	(2) TEMP	(3) SAL	(4) OXYGEN	(5) SGMT	(6) SOUND
(7) DELTA-D	(8) POT-EN	(9) SVA.			

(1) DEPTH: Standard Oceanographic Depth in whole metres, as well as additional depths: 125, 175, 225, 3500, 4500, 5500, 6500, 7500, 8500, 9500.

(2) TEMPERATURE: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "INTRODUCTION" to section II of the data record).

(3) SALINITY:

- A. The reported salinity values are measured to three decimal places.
 - (i) the interpolation error estimate is less than twice the standard deviation of measurement
 - the interpolated value is reported to three decimal places (e.g., 30.139).
 - (ii) the interpolation error estimate is equal to or greater than twice the standard deviation of measurement.
 - the interpolated value is reported to two decimal places, and followed by the **interpolation error estimate** (e.g., 29.23 C).
- B. The reported salinity values are measured to two decimal places and followed by the **measurement error estimate**.
 - the interpolated value is reported to two decimal places, and followed by the **combined measurement and interpolation error estimate** (e.g., 30.59 B).

(4) OXYGEN: Interpolated value at standard depth, followed by the **combined measurement and interpolation error estimate** (see "Introduction" to section II of the data record).

(5) SIGMA-T: Computed from temperature and salinity values at standard oceanographic depth.

(6) SOUND VELOCITY: Computed from temperature, salinity and total pressure values at standard oceanographic depth, using Wilson's formula (1960).

(7) DELTA-D: The geo-potential anomaly as defined by:

$$\Delta D = \int_o^p \delta dp$$
 ΔD is expressed in dynamic metres (10^5 ergs/gram) and recorded to three decimal places (e.g., 2.345 dyn. metres).

(8) POTENTIAL ENERGY ANOMALY: The Potential energy anomaly χ as defined by:

$$\chi = 1/g \int_o^p p \delta dp = \int_o^z \rho p \delta dz$$
 χ is expressed in units of 10^8 ergs/cm² and recorded to two decimal places (e.g., 116.44).

(9) SPECIFIC VOLUME ANOMALY: The specific volume anomaly as defined by:

$$\delta = \sigma - \sigma_{35.0.P}$$
 δ is expressed in ml/gr, and conventionally reported as $10^5 \delta$, to one decimal place (i.e., δ reported as 1234, reads 123.4, and corresponds to a specific volume anomaly of 0.001234 ml/gr.).

SPECIAL CHARACTERS

‡ (Record mark): is used to indicate inconsistencies which are printed in an area below the "Observed Data". A corresponding record mark at the extreme left hand side indicates the level at which the inconsistency occurs

* (Asterisk): this character may occur in the **interpolated** portion of the data record. It is printed at the extreme left hand side of the page, when three or more standard depth levels fall within any one **observed depth interval**. The **third**, and all consequent levels are preceded by the asterisk to indicate that more than **two** machine interpolations were carried out, utilizing the same set of interpolation parabolas. The asterisk will also appear when the last standard depth is an extrapolation and there are at least two interpolations between the last two observed depths.

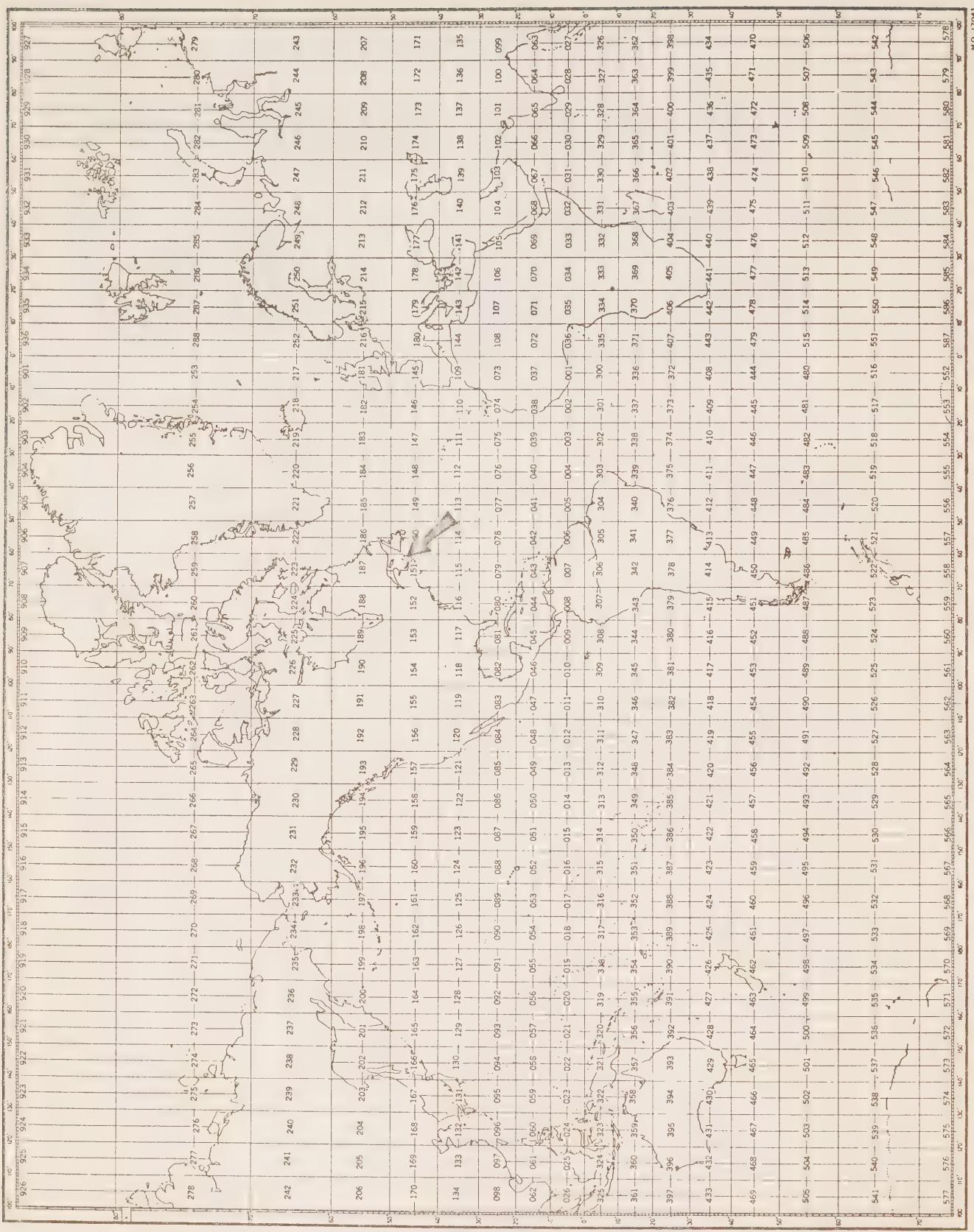


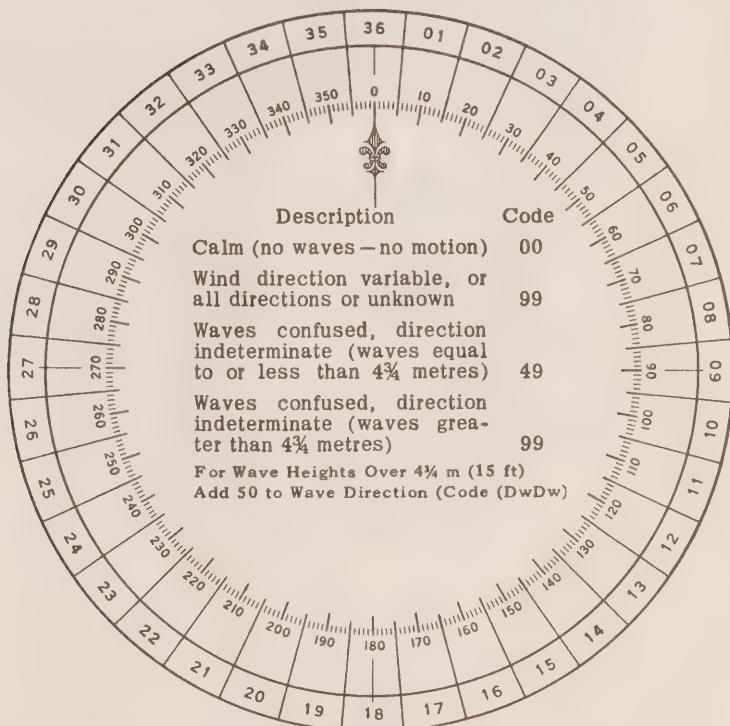
Table 1
CONVERSION
MINUTES TO $\frac{1}{10}$ HRS.

Minutes	Tenths Hrs.
00-03	0
04-08	1
09-15	2
16-20	3
21-27	4
28-32	5
33-39	6
40-44	7
45-51	8
52-56	9
57-59	0 (next HR.)

Table 2
WATER COLOR CODE
Based on Percentage Yellow

Code:	Description
00	Deep Blue
10	Blue
20	Greenish Blue
30	Bluish Green
40	Green
50	Light Green
60	Yellowish Green
70	Yellow Green
80	Green Yellow
90	Greenish Yellow
99	Yellow

Table 3. DIRECTION CODE (dd)



NOTE:

Always use the true direction from which the wind is blowing, or the direction from which Waves I (sea), or Waves II (swell) come.

Table 4. PERIOD OF THE WAVES (P_w)
 (Measure to the Nearest Second)

Code:	Period in Seconds:	Code:	Period in Seconds:
2	5 sec. or less	8	16 or 17 sec.
3	6 or 7 sec.	9	18 or 19 sec.
4	8 or 9 sec.	0	20 or 21 sec.
5	10 or 11 sec.	1	Over 21 sec.
6	12 or 13 sec.	X	Calm, or period not determined
7	14 or 15 sec.		

Table 5. HEIGHT OF THE WAVES (H_w)

- The average value of the wave height (vertical distance between trough and crest) is reported, as obtained from the larger well formed waves of the wave system being observed.
- Each code figure provides for reporting a range of heights. For example: 1 = $\frac{1}{4}$ m (1 ft) to $\frac{3}{4}$ m (2 $\frac{1}{2}$ ft); 5 = $2\frac{1}{4}$ m (7 ft) to $2\frac{3}{4}$ m (9 ft); 9 = $4\frac{1}{4}$ m (13 $\frac{1}{2}$ ft) to $4\frac{3}{4}$ m (15 ft), etc.
- If a wave height comes exactly midway between the heights corresponding to two code figures, the lower code figure is reported; e.g. a height of $2\frac{3}{4}$ m is reported by code figure 5.

Code	Code
0 Less than $\frac{1}{4}$ m (1 ft)	0 5 m (16 ft)
1 $\frac{1}{2}$ m (1 $\frac{1}{2}$ ft)	1 $5\frac{1}{2}$ m (17 $\frac{1}{2}$ ft)
2 1 m (3 ft)	2 6 m (19 ft)
3 $1\frac{1}{2}$ m (5 ft)	Add 3 $6\frac{1}{2}$ m (21 ft)
4 2 m (6 $\frac{1}{2}$ ft)	50 to 4 7 m (22 $\frac{1}{2}$ ft)
5 $2\frac{1}{2}$ m (8 ft)	to 5 $7\frac{1}{2}$ m (24 ft)
6 3 m (9 $\frac{1}{2}$ ft)	Dw Dw 6 8 m (25 $\frac{1}{2}$ ft)
7 $3\frac{1}{2}$ m (11 ft)	7 8 $\frac{1}{2}$ m (27 ft)
8 4 m (13 ft)	8 9 m (29 ft)
9 $4\frac{1}{2}$ m (14 ft)	9 $9\frac{1}{2}$ m (30 $\frac{1}{2}$ ft) or more
x Height not determined	

Table 6. WIND FORCE CODE

The Beaufort force of the wind is estimated from the appearance of the sea surface, according to the table below. This table is only intended as a guide to show roughly what may be expected on the open sea, remote from land. Factors which must be taken into account are the "lag" effect between the wind increasing and the sea getting up; and the influence of "fetch", depth, swell, heavy rain and tide effect on the appearance of the sea. Estimation of the wind force by this method becomes unreliable in shallow water or when close inshore, owing to the tidal effect and the shelter provided by the land.

Code	Appearance of sea if fetch and duration of the blow have been sufficient to develop the sea fully	Description
00	Sea like a mirror	Calm
01	Ripples with the appearance of scales are formed, but without foam crests.	Light Air
02	Small wavelets; crests have a glassy appearance and do not break.	Light Breeze
03	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses.	Gentle Breeze
04	Small waves, becoming longer; fairly frequent white horses.	Moderate breeze
05	Moderate waves; many white horses are formed (chance of some spray)	Fresh Breeze
06	Large waves; white foam crests everywhere (probably some spray)	Strong Breeze
07	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind.	Near Gale
08	Moderately high waves; edges of crests begin to break into the spindrift; foam is blown in well-marked streaks along the direction of the wind.	Gale
09	High waves; dense streaks of foam along wind; crests begin to topple, tumble and roll over; spray may affect visibility.	Strong Gale
10	Very high waves with long overhanging crests; foam in great patches blown in dense white streaks along wind; sea surface takes a white appearance; tumbling becomes heavy and shock-like; visibility affected.	Storm
11	Exceptionally high waves (medium sized ships may be lost to view behind waves); sea covered with long white patches of foam lying along the wind; everywhere edges of crests are blown into froth; visibility affected.	Violent Storm
12	Air is filled with foam and spray; sea completely white with driving spray; visibility seriously affected.	Hurricane

Table 7. PRESENT WEATHER
W.W. CODE

NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

No meteors except photometors	Code figure WW	characteristic change of the state of sky during the past hour	ww = 20 - 29	
			Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour but not at the time of observation	not falling as shower(s)
	00	Cloud development not ob- served or not observable	20	Drizzle (not freezing) or snow grains
	01	Clouds generally dissolving or becoming less developed	21	Rain (not freezing)
	02	State of sky on the whole unchanged	22	Snow
	03	Clouds generally forming or developing	23	Rain and snow or ice pellets, type (a)
	04	Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes	24	Freezing drizzle or freezing rain
	05	Haze	25	Shower(s) of rain
	06	Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation	26	Shower(s) of snow, or of rain and snow
	07	Dust or sand raised by wind at or near the sta- tion at the time of observation, but no well de- veloped dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen	27	Shower(s) of hail, or of rain and hail
	08	Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preced- ing hour or at the time of observation, but no duststorm or sandstorm	28	Fog or ice fog
	09	Duststorm or sandstorm within sight at the time of observation, or at the station during the pre- ceding hour	29	Thunderstorm (with or without precipitation)
	10	Mist	ww = 30 - 39	Duststorm, sandstorm, drifting or blowing snow
	11	Patches of shallow fog or ice fog at the sta- tion, whether on land or sea, not	30	- has decreased during the preceding hour
	12	More of less } deeper than about 2 metres on continuous } land or 10 metres at sea	31	- no appreciable change during the preceding hour
	13	Lightning visible, no thunder heard	32	- has begun or has increased during the preceding hour
	14	Precipitation within sight, not reaching the ground or the surface of the sea	33	- has decreased during the preceding hour
	15	Precipitation within sight, reaching the ground or the surface of the sea, but distant (i.e. es- timated to be more than 5 km) from the station	34	- no appreciable change du- ring the preceding hour
	16	Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station	35	- has begun or has increased during the preceding hour
	17	Thunderstorm, but no precipitation at the time of observation	36	Slight or moderate } generally low (below eye blowing snow } level)
	18	Squalls } at or within sight of the sta- tion during the preceding hour	37	Heavy drifting snow
	19	Funnel clouds } or at the time of observation	38	Slight or moderate } generally high (above eye blowing snow } level)
			39	Heavy blowing snow
			ww = 40 - 49	Fog or ice fog at the time of observation
	40	Fog or ice fog at a distance at the time of ob- servation, but not at the station during the pre- ceding hour, the fog or ice fog extending to a level above that of the observer	40	Fog or ice fog at a distance at the time of ob- servation, but not at the station during the pre- ceding hour, the fog or ice fog extending to a level above that of the observer
	41	Fog or ice fog in patches	41	Fog or ice fog in patches
	42	Fog or ice fog, sky visible	42	Fog or ice fog, sky visible
	43	Fog or ice fog, sky invisible	43	Fog or ice fog, sky } has become thinner during invisible } the preceding hour
	44	Fog or ice fog, sky visible	44	Fog or ice fog, sky } no appreciable change visible } during the preceding hour
	45	Fog or ice fog, sky invisible	45	Fog or ice fog, sky } during the preceding hour
	46	Fog or ice fog, sky visible	46	Fog or ice fog, sky } has begun or has become visible } thicker during the pre- ceding hour
	47	Fog or ice fog, sky invisible	47	Fog or ice fog, sky } has begun or has become invisible } thicker during the pre- ceding hour
	48	Fog, depositing rime, sky visible	48	Fog, depositing rime, sky visible
	49	Fog, depositing rime, sky invisible	49	Fog, depositing rime, sky invisible

NO PRECIPITATION ON STATION AT TIME OF OBSERVATION

PRECIPITATION ON STATION AT TIME OF OBSERVATION

ww = 50 - 59 Drizzle

50 Drizzle, not freezing, intermittent } slight at time of observation
 51 Drizzle, not freezing, continuous
 52 Drizzle, not freezing, intermittent } moderate at time of observation
 53 Drizzle, not freezing, continuous
 54 Drizzle, not freezing, intermittent } heavy (dense) at time of
 55 Drizzle, not freezing, continuous } observation
 56 Drizzle, freezing, slight
 57 Drizzle, freezing, moderate or heavy (dense)
 58 Drizzle and rain, slight
 59 Drizzle and rain, moderate or heavy

ww = 60 - 69 Rain

60 Rain, not freezing, intermittent } slight at time of observation
 61 Rain, not freezing, continuous
 62 Rain, not freezing, intermittent } moderate at time of observation
 63 Rain, not freezing, continuous
 64 Rain, not freezing, intermittent } heavy at time of observation
 65 Rain, not freezing, continuous
 66 Rain, freezing, slight
 67 Rain, freezing, moderate or heavy
 68 Rain or drizzle and snow, slight
 69 Rain or drizzle and snow, moderate or heavy

70 - 79 Solid precipitation not in showers

ww
 70 Intermittent fall of snow flakes } slight at time of observation
 71 Continuous fall of snow flakes
 72 Intermittent fall of snow flakes } moderate at time of observation
 73 Continuous fall of snow flakes
 74 Intermittent fall of snow flakes } heavy at time of observation
 75 Continuous fall of snow flakes
 76 Ice prisms (with or without fog)
 77 Snow grains (with or without fog)
 78 Isolated starlike snow crystals (with or without fog)
 79 Ice pellets, type (a)

ww = 80 - 99 Showery precipitation, or precipitation with current or recent thunderstorm

80 Rain shower(s), slight
 81 Rain shower(s), moderate or heavy
 82 Rain shower(s), violent
 83 Shower(s) of rain and snow mixed, slight
 84 Shower(s) of rain and snow mixed, moderate or heavy
 85 Snow shower(s), slight
 86 Snow shower(s), moderate or heavy
 87 Shower(s) of snow pellets or ice pellets, type (b), with or without rain } - slight
 88 or rain and snow mixed } - moderate or heavy
 89 Shower(s) of hail, with or without rain or rain and snow mixed, not associated with thunder } - slight
 90 } - moderate or heavy
 91 Slight rain at time of observation
 92 Moderate or heavy rain at time of observation
 93 Slight snow, or rain and snow mixed or hail at time of observation } thunderstorm during the preceding hour but not at time of observation
 94 Moderate or heavy snow, or rain and snow mixed or hail at time of observation
 95 Thunderstorm, slight or moderate, without hail, but with rain and/or snow at time of observation
 96 Thunderstorm, slight or moderate, with hail at time of observation
 97 Thunderstorm, heavy, without hail, but with rain and/or snow at time of observation } thunderstorm at time of observation
 98 Thunderstorm, combined with duststorm or sandstorm at time of observation
 99 Thunderstorm, heavy, with hail at time of observation

Table 8. CLOUD TYPE CODE

Code	Cloud Type	Code	Cloud Type
0	Cirrus	Ci	Nimbostratus
1	Cirrocumulus	Cc	Stratocumulus
2	Cirrostratus	Cs	Stratus
3	Altocumulus	Ac	Cumulus
4	Altostratus	As	Cumulonimbus
X	Cloud not visible owing to darkness, fog, duststorm, sandstorm, or other analogous phenomena		

Table 9. CLOUD AMOUNT CODE

Code	Cloud Cover	Code	Cloud Cover
0	0	6	6 oktas
1	1 okta or less, but not zero	7	7 oktas or more, but not 8 oktas
2	2 oktas	8	8 oktas
3	3 oktas	9	Sky obscured, or cloud amount cannot be estimated
4	4 oktas		
5	5 oktas		

Note: 1 okta = $\frac{1}{8}$ of the sky covered

Table 10. VISIBILITY

Code	Estimate of hor. Visibility
0	Less than 50 metres (less than 55 yards)
1	50-200 metres (approx. 55-220 yards)
2	200-500 metres (approx. 220-550 yards)
3	500-1,000 metres (approx. 550 yards- $\frac{5}{6}$ n.m.)
4	1-2 km (approx. $\frac{5}{6}$ -1 n.m.)
5	2-4 km (approx. 1-2 n.m.)
6	4-10 km (approx. 2-6 n.m.)
7	10-20 km (approx. 6-12 n.m.)
8	20-50 km (approx. 12-30 n.m.)
9	50 km or more (30 n.m. or more)

Note: n.m. = nautical mile

TABLE 11. INSTITUTE CODE

Code	Institute
01	Marine Ecology Laboratory, Bedford Institute
02	Pacific Oceanographic Group
03	Biological Station, St. Andrews, N.B.
04	Arctic Biological Station, Ste. Anne de Bellevue, P.Q.
05	Biological Station, St. John's Nfld.
06	Station de Biologie Marine, Grande Riviere, P.Q.
07	Marine Sciences Branch, Central Region
08	Defence Research Establishment, Atlantic
09	Defence Research Establishment, Pacific
10	Atlantic Oceanographic Laboratory, Bedford Institute
11	Polar Continental Shelf Project
12	Great Lakes Institute
13	Institute of Oceanography, University of British Columbia
14	Institute of Oceanography, Dalhousie University
15	Marine Sciences Branch, Pacific Region
16	Department of Transport
17	Marine Sciences Centre, McGill University
18	Canadian Forces Maritime Command, East Coast
19	Canadian Forces Maritime Command, West Coast
20	Ontario Water Resources Commission
21	Dept. of National Health and Welfare
22	Inland Waters Branch, Dept. of Energy, Mines and Resources.

SECTION III

Serial oceanographic data

GENERAL INFORMATION

Institute: Atlantic Oceanographic Laboratory
Observation platform: CNAV "Sackville"
Vessel's cruising speed: 10 knots
Total number of stations occupied: 35
Anemometer height above sea level: 11 metres
Barometer readings: Aneroid Barometer (corrected)
Air temperature: Fixed Thermometer
Surface sea water temperature: Bucket Sample (deck thermometer)

The following Standard Deviations were used to express both measurement and interpolation error estimates.

Temperature:	0.02
Salinity:	0.003

C-REF-NO 004	YR 1968	DEPTH 91	WAVES 1 31X3	AIR T 03.8	VIS 7
CONS. NO 001	MONTH 11	MXSAMPD 01	WAVES 2 31X3	WET B	STN
LAT 46-542N	DAY 15	NO.DPTH 7	WND-DIR 310	WW-CODE 02	
LON 60-102W	HR 19.5	W-COLOR	WND-FCE 07	CLD-TPE	
MARSD SQ 151	C/I 1810	W-TRNSP	BARO 990.0	CLD-AMT 8	HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
195	0000	067	B	30482	2393	14719
195	0009	0657		30482	2394	14716
195	0018	0657		30511	2397	14717
195	0027	0646		30568	2403	14715
195	0036	0615		30683	2415	14706
195	0045	0572		30818	2431	14691
195	0068	0430		31316	2485	14643

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0670	B	30482	2393	14719	0000	00000	3988
0010	0657		30484	2395	14716	0040	00002	3972
0020	0656		30520	2398	14717	0080	00008	3945
0030	0637		30602	2406	14713	0119	00018	3862
0050	0547		30913	2441	14683	0193	00048	3529

C-REF-NO 004 YR 1968 DEPTH 310 WAVES 1 31X3 AIR T 03.8 VIS 7
 CO. IS. NO 002 MONTH 11 MXSAMPD 03 WAVES 2 31X3 WET B STN
 LAT 47-054N DAY 15 NO.DPTH 12 WND-DIR 310 WW-CODE 26
 LON 60-002W HR 21.7 W-COLOR WND-FCE 07 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1002.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	T	E	M	P	S	A	L	OXYGEN	SGMT	SOUND
217	0000	068	B	30676					2407	14726	
217	0009	0677		30657					2406	14726	
217	0017	0674		30661					2406	14726	
217	0026	0678		30661					2406	14729	
217	0035	0676		30664					2406	14730	
217	0043	0622		30822					2425	14712	
217	0065	0120		32547					2609	14524	
217	0087	0133		32792					2627	14537	
217	0130	0242		33386					2667	14600	
217	0147	0375		33926					2698	14668	
217	0217	0413		33941					2695	14695	
217	0260	0433		34227					2716	14715	

I N T E R P O L A T E D

DEPTH	T	E	M	P	S	A	L	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0680	B	30676					2407	14726	0000	00000	3855	
0010	0676		30657					2406	14726	0039	00002	3866	
0020	0675		30661					2406	14727	0078	00008	3862	
0030	0681		3065 C					2405	14731	0116	00018	3878	
0050	0462	I	3135 I					2485	14654	0187	00046	3115	
0075	0092	I	3275 I					2626	14516	0248	00083	1765	
0100	0143	D	3291 I					2636	14545	0291	00122	1676	
0125	0218	B	3329 F					2661	14588	0331	00167	1443	
0150	0385	C	3396 I					2699	14673	0363	00211	1084	
0175	0440	I	3411 I					2706	14702	0389	00255	1027	
*0200	0442	I	3408 I					2703	14706	0416	00306	1059	
0225	0494	I	3437 I					2720	14736	0440	00360	0899	
0250	0459	I	3430 I					2718	14725	0463	00415	0917	

C-REF-NO 004 YR 1968 DEPTH : 457 WAVES 1 31X2 AIR T 02.2 VIS 8
 CONS. NO 003 MONTH 11 MXSAMPD 04 WAVES 2 31X2 WET B STN
 LAT 47-140N DAY 16 NO.DPTH 14 WND-DIR 310 WW-CODE 01
 LON 59-510W HR 14.2 W-COLOR WND-FCE. 05 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARO 1002.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
142	0000	063	B	31249	2458	14713
142	0009	0626		31132	2449	14712
142	0019	0624		31199	2455	14713
142	0028	0552		31787	2510	14693
142	0038	0315		32318	2576	14602
142	0047	0243		32509	2597	14575
142	0070	0197		32754	2620	14562
142	0094	0204		32870	2629	14571
142	0141	0275		33507	2674	14618
142	0188	0397		34056	2706	14686
142	0235	0440		34353	2725	14715
142	0282	0419		34448	2735	14716
142	0329	0428		34621	2748	14729
142	0376	0431		34735	2756	14740

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0630	B	31249	2458	14713	0000	00000	3366
0010	0628		3112 B	2448	14712	0034	00002	3461
0020	0621		3126 C	2460	14713	0069	00007	3353
0030	0505	D	3191 B	2525	14676	0099	00015	2733
0050	0230	B	3256 B	2602	14571	0147	00033	2002
0075	0195		3278 C	2622	14562	0195	00064	1808
0100	0210		3294 D	2634	14575	0239	00103	1698
0125	0244		3327 H	2657	14599	0279	00149	1478
0150	0299	B	3363 B	2681	14632	0313	00197	1254
0175	0365	B	3392 B	2699	14668	0343	00246	1093
0200	0415		34153	2712	14696	0369	00296	0971
0225	0437		34309	2722	14712	0392	00347	0881
0250	0435	B	3439 C	2729	14716	0414	00399	0821
0300	0421		3451 B	2740	14720	0453	00508	0718

C-REF-NO 004 YR 1968 DEPTH 475 WAVES 1 31X3 AIR T 01.1 VIS B
 CONS. NO 004 MONTH 11 MXSAMPD 04 WAVES 2 31X3 WET B STN
 LAT 47-250N DAY 16 NO.DPTH 14 WND-DIR 310 WW-CODE 02
 LON 59-346W HR 16.6 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARD 1002.0 CLD-AMT 6 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
166	0000	063	B	31930	2512	14722
166	0009	0640		31945	2512	14728
166	0018	0640		31940	2511	14729
166	0026	0640		31942	2511	14731
166	0037	0639		31942	2511	14732
166	0046	0631		31965	2514	14731
166	0069	0227		32721	2615	14575
166	0095	0216		33063	2643	14579
166	0138	0328		33629	2679	14642
166	0184	0498		34214	2708	14729
166	0230	0551		34534	2727	14763
166	0276	0475		34576	2739	14740
166	0322	0446		34656	2749	14736
166	0368	0441		34746	2756	14743

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0630	B	31930	2512	14722	0000	00000	2856
0010	0640		31945	2512	14728	0029	00001	2858
0020	0640		31940	2511	14730	0058	00006	2862
0030	0640		31940	2511	14731	0086	00013	2864
0050	0567	I	3208 I	2531	14707	0142	00036	2679
0075	0201	F	3282 E	2625	14566	0198	00070	1777
0100	0224		33129	2648	14584	0240	00108	1564
0125	0283	B	33459	2669	14618	0277	00150	1364
0150	0375	C	3380 C	2688	14667	0309	00195	1196
0175	0467	B	3411 B	2703	14713	0338	00242	1057
0200	0530		34356	2715	14747	0363	00291	0948
0225	0551		34512	2725	14762	0386	00340	0859
0250	0523	D	3457 D	2733	14755	0407	00391	0787
0300	0455		34615	2744	14736	0444	00495	0680

C-REF-NO 004 YR 1968 DEPTH 265 WAVES 1 31X3 AIR T 02.2 VIS B
 CONS. NO 005 MONTH 11 MXSAMPD 02 WAVES 2 31X3 WET B STN
 LAT 47-347N DAY 16 NO.DPTH 11 WND-DIR 310 WW-CODE 02
 LON 59-208W HR 18.8 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARO 999.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
188	0000	065	B	31860	2504	14729
188	0009	0644		31864	2505	14729
188	0018	0644		31864	2505	14730
188	0026	0645		31864	2505	14732
188	0035	0639		31864	2505	14731
188	0044	0638		31864	2505	14732
188	0066	0634		31855	2505	14734
188	0088	0633		31867	2506	14737
188	0132	0381		33368	2653	14660
188	0177	0558		34188	2699	14752
188	0221	0608		34407	2710	14782

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0650	B	31860	2504	14729	0000	00000	2932
0010	0644		31864	2505	14729	0029	00002	2923
0020	0644		31864	2505	14731	0059	00006	2925
0030	0642		31864	2505	14731	0088	00014	2924
0050	0637		31861	2505	14732	0147	00038	2921
0075	0638	B	3183 F	2503	14737	0221	00085	2950
0100	0560	I	3221 I	2542	14714	0290	00147	2573
0125	0418	H	3309 I	2627	14671	0345	00208	1769
0150	0433	I	3378 B	2680	14691	0383	00262	1269
0175	0547	B	34166	2698	14747	0413	00311	1106
0200	0521	I	3439 C	2719	14744	0439	00360	0911
0225	0628	D	34394	2706	14791	0463	00414	1043

C-REF-NO 004 YR 1968 DEPTH 219 WAVES 1 31X3 AIR T 02.7 VIS 8
 CONS. NO 006 MONTH 11 MXSAMPD 02 WAVES 2 31X3 WET 8 STN
 LAT 48-009N DAY 16 NO.DPTH 10 WND-DIR 310 WW-CODE 86
 LON 59-335W HR 23.0 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARO 1000.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
230	0000	067	B	31876	2502	14738
230	0010	0657		31845	2502	14734
230	0020	0657		31845	2502	14735
230	0030	0658		31850	2502	14737
230	0039	0656		31854	2502	14738
230	0049	0652		31908	2507	14739
230	0074	0580		32048	2527	14716
230	0098	0356		32578	2593	14633
230	0147	0367		33539	2668	14659
230	0196	0532		34137	2698	14744

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0670	B	31876	2502	14738	0000	00000	2945
0010	0657		31845	2502	14734	0030	00002	2953
0020	0657		31845	2502	14735	0059	00006	2954
0030	0658		31850	2502	14737	0089	00014	2953
0050	0652		31909	2507	14739	0148	00038	2903
0075	0571		32067	2530	14712	0218	00083	2693
0100	0349	B	32622	2597	14631	0278	00135	2051
0125	0314	I	3314	2641	14627	0324	00188	1631
0150	0301	I	3356	2676	14631	0361	00240	1307
0175	0389	I	3390	2695	14678	0392	00290	1131
*0200	0566	D	34176	2697	14759	0421	00345	1125

C-REF-NO 004 YR 1968 DEPTH 466 WAVES 1 31X3 AIR T 01.1 VIS 8
 CONS. NO 007 MONTH 11 MXSAMPD 04 WAVES 2 31X3 WET B STN
 LAT 48-095N DAY 17 NO.DPTH 14 WND-DIR 310 WW-CODE 01
 LON 60-055W HR 02.5 W-COLOR WND-FGE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1003.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
025	0000	063	B	31870	2507	14722
025	0009	0630		31862	2506	14723
025	0019	0630		31862	2506	14725
025	0028	0630		31862	2506	14726
025	0038	0630		31862	2506	14728
025	0047	0629		31862	2506	14729
025	0070	0180		32588	2608	14552
025	0094	0180		32859	2630	14560
025	0141	0431		33746	2678	14688
025	0188	0521		34294	2711	14740
025	0235	0504		34506	2730	14744
025	0282	0493		34653	2743	14749
025	0328	0457		34725	2753	14743
025	0377	0441		34757	2757	14745

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA	
0000	0630	B	31870	2507	14722	0000	00000	2901	
0010	0630		31862	2506	14723	0029	00001	2908	
0020	0630		31862	2506	14725	0058	00006	2909	
0030	0630		31862	2506	14726	0088	00013	2910	
0050	0576	I	3194	I	2519	14709	0145	00037	2791
0075	0157	E	3266	F	2615	14544	0204	00073	1871
0100	0207	E	3297	E	2636	14574	0248	00113	1673
0125	0336	I	3344	I	2663	14641	0287	00157	1427
0150	0459		33877		2685	14703	0321	00204	1220
0175	0510		34176		2703	14732	0349	00252	1055
0200	0521	B	3437	C	2717	14743	0374	00300	0929
0225	0512	B	3448	C	2727	14745	0397	00348	0838
0250	0502		34560		2735	14746	0417	00397	0767
0300	0479		34688		2747	14747	0453	00498	0652

C-REF-NO 004 YR 1968 DEPTH 420 WAVES 1 31X3 AIR T 01.1 VIS 8
 CONS. NO 008 MONTH 11 MXSAMPD 04 WAVES 2 31X4 WET B STN
 LAT 48-221N DAY 17 NO.DPTH 14 WND-DIR 310 WW-CODE 70
 LON 60-395W HR 06.8 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1004.0 CLD-ANT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
068	0000	057	B	31754	2505	14696
068	0010	0570		31706	2501	14697
068	0019	0570		31706	2501	14698
068	0029	0571		31704	2501	14700
068	0039	0352		32070	2553	14615
068	0049	0123		32435	2599	14521
068	0073	0138		32677	2618	14535
068	0097	0146		32775	2625	14544
068	0146	0383		33785	2686	14669
068	0195	0463		33248	2635	14703
068	0243	0457		34475	2733	14725
068	0292	0440		34606	2745	14728
068	0341	0432		34698	2753	14734
068	0390	0432		34740	2757	14743

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0570	B	31754	2505	14696	0000	00000	2919
0010	0570		31706	2501	14697	0030	00002	2956
0020	0575	B	3170	2500	14700	0059	00006	2969
0030	0554	B	3173	2505	14694	0089	00014	2921
0050	0116	C	3246	2602	14518	0138	00033	2001
0075	0137		3268	2618	14535	0187	00064	1841
0100	0159	B	3284	2630	14551	0232	00104	1734
0125	0273	I	3338	2664	14613	0271	00149	1415
0150	0394		3374	2681	14674	0305	00197	1259
0175	0445	B	3345	2653	14695	0340	00256	1527
0200	0465		3336	2644	14706	0380	00332	1618
0225	0465	B	3398	2693	14719	0415	00408	1159
0250	0455		3453	2738	14726	0439	00465	0737
0300	0438		34624	2747	14729	0474	00564	0654

C-REF-NO 004 YR 1968 DEPTH 374 WAVES 1 36X3 AIR T 01.6 VIS 8
 CONS. NO 009 MONTH 11 MXSAMPD 03 WAVES 2 36X3 WET B STN
 LAT 48-36ON DAY 17 NO.DPTH 13 WND-DIR 360 WND-CODE 70
 LON 61-110W HR 10.7 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SO 151 C/I 1810 W-TRNSP BARO 1000.8 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
107	0000	054	B	31822	2514	14684
107	0009	0542		31775	2510	14686
107	0017	0542		31776	2510	14687
107	0026	0546		31783	2510	14690
107	0035	0561		31873	2515	14699
107	0043	0470		32252	2555	14668
107	0065	0282		32892	2624	14600
107	0087	0336		33320	2654	14633
107	0130	0382		33806	2688	14666
107	0173	0409		34139	2711	14689
107	0217	0443		34419	2730	14714
107	0260	0451		34573	2741	14727
107	0303	0440		34659	2749	14731

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0540	B	31822	2514	14684	0000	00000	2835
0010	0542		31774	2510	14686	0029	00001	2874
0020	0542		31773	2510	14688	0058	00006	2876
0030	0560	C	3180	2510	14697	0087	00013	2879
0050	0392	C	3250	2583	14640	0137	00034	2180
0075	0293	E	33107	2640	14610	0185	00063	1635
0100	0355		3350	2666	14646	0224	00097	1396
0125	0379		3377	2685	14664	0257	00135	1221
0150	0395		3397	2700	14677	0286	00176	1082
0175	0411		34154	2712	14690	0311	00219	0965
0200	0431		34322	2724	14705	0334	00263	0862
0225	0446		34455	2733	14718	0355	00308	0782
0250	0451		34545	2739	14725	0374	00354	0722
0300	0442		34657	2749	14731	0408	00450	0633

C-REF-NO 004 YR 1968 DEPTH 210 WAVES 1 36X3 AIR T 00.5 VIS. 8
 CONS. NO 010 MONTH 11 MXSAMPD 02 WAVES 2 36X3 WET B STN
 LAT 48-535N DAY 17 NO.DPTH 10 WND-DIR 360 WW-CODE 70
 LON 61-385W HR 13.7 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SO 151 C/I 1810 W-TRNSP BARO 1011.0 CLD-ANT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
137	0000	049	B	31678	2508	14662
137	0010	0490		31675	2508	14663
137	0020	0493		31684	2508	14666
137	0030	0502		31700	2508	14672
137	0039	0466		31770	2518	14659
137	0049	0075		32250	2587	14497
137	0074	0037		32472	2607	14487
137	0098	0093		32796	2630	14521
137	0148	0136		32962	2641	14551
137	0197	0280		33590	2680	14631

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0490	B	31678	2508	14662	0000	00000	2891
0010	0490		31675	2508	14663	0029	00001	2894
0020	0493		31684	2508	14666	0058	00006	2891
0030	0502		31700	2508	14672	0087	00013	2889
0050	0060	D	3227	2590	14491	0138	00033	2110
0075	0039		32486	2608	14488	0188	00066	1935
0100	0095		3281	2631	14522	0235	00107	1723
0125	0116	D	3290	2637	14537	0277	00156	1664
0150	0170	I	3315	2654	14569	0317	00212	1508
0175	0226	F	3338	2668	14601	0353	00272	1376
*0200	0288	B	3362	2682	14635	0387	00336	1252

C-REF-NO 004 YR 1968 DEPTH 274 WAVES 1 36X3 AIR T 00.0 VIS 8
 CONS. NO 011 MONTH 11 MXSAMPD 02 WAVES 2 36X3 WET B STN
 LAT 49-080N DAY 17 NO.DPTH 11 WND-DIR 360 WW-CODE 01
 LON 60-015W HR 21.2 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1014.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
212	0000	059	B	31872	2512	14705
212	0010	0596		31852	2510	14709
212	0020	0595		31852	2510	14710
212	0030	0598		31856	2510	14713
212	0040	0601		31868	2510	14716
212	0050	0222		32299	2582	14564
212	0074	0115		32651	2617	14525
212	0099	0194		33040	2643	14569
212	0148	0398		33881	2692	14677
212	0198	0475		34300	2717	14723
212	0248	0450		34586	2743	14725

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0590	B	31872	2512	14705	0000	00000	2853
0010	0596		31852	2510	14709	0029	00001	2876
0020	0595		31852	2510	14710	0058	00006	2876
0030	0598		31856	2510	14713	0087	00013	2877
0050	0222		32299	2582	14564	0138	00034	2190
0075	0116		32666	2618	14526	0188	00066	1841
0100	0198		33059	2644	14572	0232	00104	1598
0125	0306	D	3351	2671	14629	0269	00146	1348
0150	0403		33903	2693	14680	0300	00190	1143
0175	0454		3414	2707	14708	0327	00236	1018
0200	0481	B	3437	2722	14727	0351	00282	0883
0225	0478		3451	2734	14732	0372	00327	0773
*0250	0446		34589	2743	14724	0391	00372	0684

C-REF-NO 004 YR 1968 DEPTH 60 WAVES 1 36X3 AIR T 00.5 VIS 7
 CONS. NO 012 MONTH 11 MXSAMPD 00 WAVES 2 36X3 WET B STN
 LAT 49-198N DAY 18 NO.DPTH 6 WND-DIR 360 WW-CODE 02
 LON 58-305W HR 03.4 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARO 1014.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
034	0000	060	B	31690	2496	14707
034	0010	0605		31640	2492	14710
034	0020	0604		31642	2492	14711
034	0030	0607		31642	2492	14714
034	0040	0608		31646	2492	14716
034	0050	0246		32398	2588	14575

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0600	B	31690	2496	14707	0000	00000	3001
0010	0605		31640	2492	14710	0030	00002	3045
0020	0604		31642	2492	14711	0061	00006	3043
0030	0607		31642	2492	14714	0092	00014	3048
0050	0246		32398	2588	14575	0144	00035	2133

C-REF-NO 004 YR 1968 DEPTH 162 WAVES 1 36X2 AIR T -01.1 VIS 8
 CONS. NO 013 MONTH 11 MXSAMPD 01 WAVES 2 36X3 WET B STN
 LAT 49-350N DAY 18 NO.DPTH 9 WND-DIR 360 WW-CODE 02
 LON 58-500W HR 06.0 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 150 C/I 1810 W-TRNSP BARO 1013.0 CLD-ANT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
060	0000	056	B	31837	2513	14693
060	0010	0565		31801	2509	14696
060	0020	0565		31798	2509	14697
060	0030	0570		31804	2509	14701
060	0040	0462		32075	2542	14662
060	0050	0255		32500	2595	14581
060	0075	0191		32723	2618	14560
060	0100	0207		32948	2635	14574
060	0140	0281		33384	2664	14619

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0560	B	31837	2513	14693	0000	00000	2846
0010	0565		31801	2509	14696	0029	00001	2879
0020	0565		31798	2509	14697	0058	00006	2882
0030	0570		31804	2509	14701	0087	00013	2884
0050	0255		32500	2595	14581	0137	00033	2063
0075	0191		32723	2618	14560	0186	00064	1847
0100	0207		32948	2635	14574	0230	00104	1689
0125	0234	B	33217	2654	14594	0271	00150	1507

C-REF-NO 004 YR 1968 DEPTH 256 WAVES 1 36X2 AIR T -02.2 VIS 8
 CONS. NO 014 MONTH 11 MXSAMPD 02 WAVES 2 36X3 WET B STN
 LAT 49-500N DAY 18 NO.DPTH 11 WND-DIR 360 WW-CODE 02
 LON 59-250W HR 09.1 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SD 150 C/I 1810 W-TRNSP BARO 1015.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
091	0000	045	B	31652	2510	14645
091	0010	0445		31632	2509	14644
091	0020	0447		31633	2509	14646
091	0030	0446		31664	2511	14648
091	0040	0399		31741	2522	14631
091	0050	0203		32347	2587	14556
091	0075	0133		32508	2605	14531
091	0100	0129		32746	2624	14537
091	0149	0254		33419	2669	14609
091	0199	0411		34156	2713	14695
091	0239	0429		34394	2730	14712

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0450	B	31652	2510	14645	0000	00000	2871
0010	0445		31632	2509	14644	0029	00001	2881
0020	0447		31633	2509	14646	0058	00006	2883
0030	0446		31664	2511	14648	0087	00013	2860
0050	0203		32347	2587	14556	0137	00033	2140
0075	0133		32508	2605	14531	0189	00066	1971
0100	0129		32746	2624	14537	0236	00108	1788
0125	0180	C	3307	2646	14568	0279	00157	1578
0150	0258		33436	2670	14611	0316	00209	1361
0175	0343	D	3383	2693	14657	0347	00261	1142
0200	0387	H	3409	2710	14684	0374	00313	0992
0225	0418	D	3430	2723	14704	0397	00363	0868

C-REF-NO 004 YR 1968 DEPTH 128 WAVES 1 34X2 AIR T -02.7 VIS 8
 CONS. NO 015 MONTH 11 MXSAMPD 01 WAVES 2 34X3 WET B STN
 LAT 50-050N DAY 18 NO.DPTH 8 WND-DIR 340 WW-CODE 02
 LON 59-550W HR 11.8 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 186 C/I 1810 W-TRNSP BARO 1016.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
118	0000	033	B	31418	2503	14590
118	0010	0330		31392	2501	14592
118	0020	0333		31403	2501	14595
118	0030	0337		31407	2501	14598
118	0040	0338		31406	2501	14600
118	0050	0338		31415	2502	14602
118	0075	0335		31426	2503	14605
118	0100	0329		31426	2504	14607

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0330	B	31418	2503	14590	0000	00000	2939
0010	0330		31392	2501	14592	0030	00002	2959
0020	0333		31403	2501	14595	0059	00006	2954
0030	0337		31407	2501	14598	0089	00014	2955
0050	0338		31415	2502	14602	0148	00038	2950
0075	0335		31426	2503	14605	0223	00085	2940
0100	0329		31426	2504	14607	0296	00152	2936

C-REF-NO 004 YR 1968 DEPTH 261 WAVES 1 29X1 AIR T -02.7 VIS 8
 CONS. NO 016 MONTH 11 MXSAMPD 02 WAVES 2 29X2 WET B STN
 LAT 49-450N DAY 18 NO.DPTH 11 WND-DIR 290 WW-CODE 02
 LON 61-500W HR 22.1 W-COLOR WND-FCE 03 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1019.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
221	0000	047	B	31678	2510	14653
221	0010	0475		31632	2506	14656
221	0020	0474		31633	2506	14658
221	0030	0476		31639	2506	14660
221	0040	0474		31638	2506	14661
221	0050	0475		31638	2506	14663
221	0075	0175		32095	2569	14544
221	0100	0054		32478	2607	14499
221	0150	0147		32044	2567	14543
221	0200	0343		33819	2693	14661
221	0249	0414		34373	2729	14707

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0470	B	31678	2510	14653	0000	00000	2871
0010	0475		31632	2506	14656	0029	00002	2911
0020	0474		31633	2506	14658	0058	00006	2910
0030	0476		31639	2506	14660	0088	00013	2908
0050	0475		31638	2506	14663	0146	00037	2909
0075	0175		32095	2569	14544	0212	00079	2312
0100	0054		32478	2607	14499	0265	00126	1948
0125	0066	G	3222 I	2586	14505	0317	00186	2148
0150	0147		32044	2567	14543	0373	00266	2332
0175	0246	E	3287 I	2625	14603	0425	00351	1780
0200	0343		33819	2693	14661	0462	00421	1151
0225	0362	H	3377 I	2686	14673	0492	00486	1212
0250	0416		3440 D	2731	14708	0517	00547	0792

C-REF-NO 004 YR 1968 DEPTH 128 WAVES 1 08X1 AIR T -02.7 VIS 8
 CONS. NO 017 MONTH 11 MXSAMPD 01 WAVES 2 08X1 WET B STN
 LAT 50-030N DAY 19 NO.DPTH 8 WND-DIR 080 WW-CODE 02
 LON 64-065W HR 05.0 W-COLOR WND-FCE 04 CLD-TPE
 MARSD SQ 187 C/I 1810 W-TRNSP BARO 1018.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
050	0000	037	B			
050	0009	0380	30851		2453	14606
050	0019	0362	30946		2463	14601
050	0028	0400	31258		2484	14623
050	0037	0414	31348		2490	14631
050	0047	0404	31376		2493	14629
050	0070	0279	31849		2541	14586
050	0093	0249	31930		2550	14577

*TIME-DISTANCE CHECK FAILED

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA	
0000	0370	B	3070	I	2442	14598	0000	00000	3516
0010	0377		3087	C	2455	14605	0035	00002	3396
0020	0366		3098	C	2465	14603	0068	00007	3301
0030	0405		3129	B	2486	14626	0101	00015	3103
0050	0389	B	3143	F	2499	14624	0162	00040	2981
0075	0299	I	3176	I	2532	14594	0233	00085	2660

C-REF-NO 004 YR 1968 DEPTH 138 WAVES 1 27X1 AIR T 01.1 VIS B
 CONS. NO 018 MONTH 11 MXSAMPD 01 WAVES 2 27X1 WET B STN
 LAT 50-028N DAY 20 NO.DPTH 8 WND-DIR 270 WW-CODE 02
 LON 66-195W HR 23.0 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SD 187 C/I 1810 W-TRNSP BARO 980.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
230	0000	042	B	30817	2447	14621
230	0010	0424		30783	2444	14624
230	0019	0426		30788	2444	14626
230	0029	0431		30916	2454	14632
230	0038	0416		31019	2463	14628
230	0048	0389		31070	2470	14619
230	0072	0359		31170	2481	14611
230	0096	0320		31710	2527	14606

I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0420	B	30817	2447	14621	0000	00000	3472
0010	0424		30783	2444	14624	0035	00002	3502
0020	0427		30798	2445	14627	0070	00007	3493
0030	0430		30929	2455	14631	0105	00016	3398
0050	0386		3107 B	2470	14618	0172	00043	3252
0075	0346	C	3128 I	2491	14608	0251	00094	3057

C-REF-NO 004 YR 1968 DEPTH 301 WAVES 1 27X2 AIR T 01.1 VIS B
 CONS. NO 019 MONTH 11 MXSAMPD 03 WAVES 2 27X2 WET B STN
 LAT 49-476N DAY 21 NO.DPTH 12 WND-DIR 270 WW-CODE 02
 LON 66-198W HR 01.0 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 983.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
010	0000	036	B	30701	2443	14594
010	0009	0367		30635	2437	14597
010	0018	0370		30638	2437	14600
010	0027	0386		31088	2472	14614
010	0036	0367		31454	2502	14613
010	0045	0354		31533	2510	14610
010	0067	0237		32004	2557	14569
010	0089	0157		32317	2588	14541
010	0134	0083		32685	2622	14521
010	0177	0240		33632	2687	14611
010	0222	0335		34070	2713	14665
010	0258	0380		34319	2729	14693

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0360	B	30701	2443	14594	0000	00000	3507
0010	0367		3062 B	2436	14597	0036	00002	3572
0020	0375		3072 E	2444	14603	0071	00007	3504
0030	0381		3123 C	2483	14615	0104	00016	3126
0050	0331	C	3163 E	2520	14602	0164	00040	2782
0075	0204		32132	2570	14557	0228	00080	2304
0100	0122	B	3239 I	2596	14529	0283	00129	2051
0125	0083	B	3260 I	2615	14518	0332	00185	1871
0150	0132	F	3303 I	2647	14550	0375	00246	1572
0175	0231		3359 C	2684	14606	0411	00304	1226
0200	0296		3390 F	2703	14642	0439	00359	1047
0225	0344		3416 I	2719	14670	0464	00412	0901
0250	0374		3430 D	2728	14689	0486	00465	0826

C-REF-NO 004 YR 1968 DEPTH 320 WAVES 1 27X3 AIR T 01.1 VIS 8
 CONS. NO 020 MONTH 11 MXSAMPD 03 WAVES 2 27X3 WET B STN
 LAT 49-356N DAY 21 NO.DPTH 12 WND-DIR 270 WW-CODE 02
 LON 66-198W HR 03.0 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 985.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	T	E	M	P	S	A	L	OXYGEN	SGMT	SOUND
030	0000	032	B	31252					2491	14584	
030	0009	0317		31217					2488	14584	
030	0017	0316		31217					2488	14584	
030	0025	0316		31217					2488	14586	
030	0034	0315		31234					2490	14587	
030	0042	0314		31658					2523	14594	
030	0064	0097		32417					2600	14512	
030	0085	0085		32719					2624	14514	
030	0127	0152		33198					2659	14558	
030	0170	0261		33739					2694	14620	
030	0212	0348		34134					2717	14670	
030	0254	0400		34439					2736	14703	

I N T E R P O L A T E D

DEPTH	T	E	M	P	S	A	L	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0320	B	31252					2491	14584	0000	00000	3057	
0010	0317		31216					2488	14584	0031	00002	3082	
0020	0316		31216					2488	14585	0062	00006	3081	
0030	0316		3120	F				2486	14586	0093	00014	3097	
0050	0241	I	3200	B				2556	14568	0149	00036	2435	
0075	0077	C	3260	E				2616	14507	0203	00070	1866	
0100	0100	B	3290	C				2638	14526	0247	00110	1656	
0125	0147		33177					2657	14555	0286	00155	1474	
0150	0209		3349	C				2678	14591	0321	00203	1279	
0175	0273		33792					2697	14627	0351	00253	1107	
0200	0326		34032					2711	14657	0377	00304	0975	
0225	0365		34245					2724	14681	0400	00354	0855	
0250	0396		34415					2735	14700	0421	00403	0760	

C-REF-NO 004 YR 1968 DEPTH 307 WAVES 1 25X4 AIR T -01.1 VIS 8
 CONS. NO 021 MONTH 11 MXSAMPD 02 WAVES 2 25X4 WET B STN
 LAT 49-198N DAY 21 NO.DPTH 11 WND-DIR 250 WW-CODE 02
 LON 66-180W HR 05.3 W-COLOR WND-FCE 07 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 987.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
053	0000	028	B	31302	2498	14567
053	0009	0318		31139	2482	14583
053	0016	0318		31179	2485	14585
053	0025	0316		31232	2489	14586
053	0033	0316		31247	2490	14588
053	0041	0318		31272	2492	14590
053	0061	0325		31545	2513	14600
053	0087	0147		32266	2584	14536
053	0123	0126		33004	2645	14543
053	0164	0200		33445	2675	14588
053	0205	0310		33980	2708	14650

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0280	B	31302	2498	14567	0000	00000	2988
0010	0319		31140	2482	14584	0031	00002	3141
0020	0317		31205	2487	14585	0062	00006	3091
0030	0316		31243	2490	14587	0093	00014	3061
0050	0329	C	31361	2498	14597	0154	00039	2983
0075	0234	G	3192	2550	14568	0223	00082	2488
0100	0120	D	32569	2610	14530	0278	00131	1917
0125	0128		3303	2647	14544	0322	00181	1573
0150	0167	B	3331	2667	14570	0359	00234	1384
0175	0215	C	3367	2691	14600	0391	00287	1154
0200	0292		3393	2706	14641	0419	00339	1018

C-REF-NO 004	YR 1968	DEPTH 228	WAVES 1 25X5	AIR T -02.7	VIS 8
CONS. NO 022	MONTH 11	MXSAMPD 01	WAVES 2 25X5	WET B	STN
LAT 49-158N	DAY 21	NO.DPTH 10	WND-DIR 250	WW-CODE 02	
LON 66-168W	HR 06.7	W-COLOR	WND-FCE 08	CLD-TPE	
MARSD SQ 151	C/I 1810	W-TRNSP	BARO 988.0	CLD-AMT 4	HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
067	0000	033	B	30874	2460	14583
067	0007	0343		30809	2453	14589
067	0014	0341		30829	2455	14590
067	0022	0341		30894	2460	14592
067	0029	0341		30948	2465	14594
067	0036	0342		31033	2471	14596
067	0054	0344		31064	2474	14601
067	0072	0346		31090	2475	14605
067	0108	0159		32241	2582	14544
067	0144	0076		32747	2627	14520

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0330	B	30874	2460	14583	0000	00000	3351
0010	0343		30810	2453	14589	0034	00002	3410
0020	0341		30876	2459	14591	0068	00007	3359
0030	0341		30960	2466	14594	0101	00016	3296
0050	0344		3107	2474	14600	0167	00042	3216
0075	0333	B	3117	2483	14601	0247	00093	3132
0100	0207	E	3195	2555	14560	0317	00155	2445
0125	0153	I	3229	2586	14545	0375	00221	2151

C-REF-NO 004 YR 1968 DEPTH 338 WAVES 1 25X5 AIR T -02.2 VIS 8
 CONS. NO 023 MONTH 11 MXSAMPD 03 WAVES 2 25X5 WET B STN
 LAT 49-265N DAY 21 NO.DPTH 12 WND-DIR 250 WW-CODE 03
 LON 65-371W HR 09.7 W-COLOR WND-FCE 08 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 990.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
097	0000	030	B	31174	2486	14574
097	0009	0304		31141	2483	14577
097	0017	0303		31120	2481	14578
097	0026	0304		31144	2483	14580
097	0035	0303		31160	2485	14581
097	0043	0295		31394	2504	14582
097	0065	0079		32492	2607	14505
097	0087	0081		32778	2629	14513
097	0130	0158		33270	2664	14562
097	0173	0274		33805	2698	14627
097	0217	0349		34165	2720	14671
097	0260	0392		34378	2732	14700

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0300	B	31174	2486	14574	0000	00000	3100
0010	0304		31137	2483	14577	0031	00002	3131
0020	0303		31126	2482	14578	0063	00006	3140
0030	0304		3114 D	2483	14580	0094	00015	3133
0050	0230	I	3175 I	2537	14560	0152	00038	2611
0075	0065	D	3267 I	2622	14503	0208	00072	1806
0100	0097		3293 B	2641	14525	0251	00111	1629
0125	0146		33214	2660	14555	0290	00155	1444
0150	0212	B	3353 C	2681	14592	0324	00203	1256
0175	0278		33825	2699	14629	0353	00252	1086
0200	0325		34046	2712	14657	0379	00301	0963
0225	0361		3422 B	2723	14679	0402	00351	0868
0250	0386		34344	2730	14695	0423	00403	0803

C-REF-NO 004 YR 1968 DEPTH 118 WAVES 1 25X5 AIR T -02.2 VIS 8
 CONS. NO 024 MONTH 11 MXSAMPD 01 WAVES 2 25X5 WET B STN
 LAT 49-121N DAY 21 NO.DPTH 8 WND-DIR 270 WW-CODE 03
 LON 64-482W HR 12.6 W-COLOR WND-FCE 08 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 990.0 CLD-AMT 6 HW

O B S E R V E D

GMT	DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND
126	0000	031 B	29848		2380	14561
126	0008	0322	29771		2373	14566
126	0017	0323	29774		2373	14568
126	0025	0333	29881		2380	14575
126	0033	0337	29915		2383	14579
126	0042	0339	29936		2384	14581
126	0062	0346	30174		2403	14591
126	0083	0324	30581		2437	14590

*TIME-DISTANCE CHECK FAILED

I N T E R P O L A T E D

DEPTH	T E M P	S A L	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0310 B	29848		2380	14561	0000	00000	4113
0010	0322	29762		2372	14566	0042	00002	4187
0020	0327	2981 B		2376	14571	0084	00009	4152
0030	0336	29907		2382	14578	0125	00019	4088
0050	0343	3001 B		2390	14585	0206	00052	4019
0075	0333	3039 B		2421	14590	0304	00114	3718

C-REF-NO 004 YR 1968 DEPTH 365 WAVES 1 28X5 AIR T -02.2 VIS 8
 CONS. NO 025 MONTH 11 MXSAMPD 02 WAVES 2 28X5 WET B STN
 LAT 49-178N DAY 21 NO.DPTH 12 WND-DIR 280 WW-CODE 03
 LON 64-450W HR 22.4 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SO 151 C/I 1810 W-TRNSP BARO 996.0 CLD-AMT 6 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
224	0000	030	B	31035	2475	14572
224	0008	0309		30946	2467	14576
224	0015	0309		30948	2467	14578
224	0023	0309		30948	2467	14579
224	0030	0309		30948	2467	14580
224	0038	0310		30956	2468	14582
224	0057	0328		31178	2484	14596
224	0076	0236		32008	2557	14570
224	0113	0090		32874	2637	14523
224	0151	0166		33331	2668	14570
224	0188	0265		33734	2693	14625
224	0227	0338		34092	2715	14667

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0300	B	31035	2475	14572	0000	00000	3205
0010	0309		30943	2467	14577	0033	00002	3283
0020	0309		30948	2467	14578	0066	00007	3279
0030	0309		30948	2467	14580	0099	00015	3279
0050	0326	C	3104	2473	14592	0164	00042	3221
0075	0242		3196	2553	14572	0235	00086	2462
0100	0126	C	3265	2616	14534	0290	00134	1860
0125	0100	D	3304	2650	14532	0333	00183	1544
0150	0162		33322	2668	14568	0369	00235	1374
0175	0230		33598	2685	14606	0402	00289	1217
0200	0281	C	33848	2700	14635	0431	00344	1073
0225	0334		34075	2714	14665	0456	00400	0952

C-REF-NO 004 YR 1968 DEPTH 374 WAVES 1 28X4 AIR T -01.1 VIS 6
 CONS. NO 026 MONTH 11 MXSAMPD 03 WAVES 2 28X5 WET B STN
 LAT 49-242N DAY 21 NO.DPTH 12 WND-DIR 280 WW-CODE 02
 LON 64-408W HR 23.8 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 997.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
238	0000	030	B	31141	2483	14574
238	0009	0318		31074	2477	14582
238	0017	0318		31085	2477	14584
238	0026	0318		31086	2477	14585
238	0034	0317		31087	2478	14586
238	0043	0317		31093	2478	14588
238	0064	0047		32714	2626	14493
238	0086	0099		33011	2647	14525
238	0129	0227		33576	2683	14596
238	0171	0306		33930	2705	14642
238	0214	0370		34247	2724	14681
238	0257	0399		34423	2735	14703

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0300	B	31141	2483	14574	0000	00000	3125
0010	0318		31074	2476	14582	0032	00002	3191
0020	0318		31086	2477	14584	0064	00007	3182
0030	0317		31086	2478	14585	0096	00015	3181
0050	0231	I	3158 I	2524	14558	0155	00039	2741
0075	0051	G	3295 I	2645	14500	0210	00072	1586
0100	0141	B	3321 B	2660	14548	0248	00106	1446
0125	0215		33528	2680	14590	0282	00145	1257
0150	0270		3377 B	2695	14621	0312	00187	1121
0175	0313		33963	2707	14646	0339	00232	1013
0200	0352		34154	2718	14670	0363	00278	0908
0225	0378		3429 C	2727	14687	0385	00326	0834
0250	0396		34398	2733	14700	0405	00375	0773

C-REF-NO 004 YR 1968 DEPTH 301 WAVES 1 28X4 AIR T -01.1 VIS 16
 CONS. NO 027 MONTH 11 MXSAMPD 03 WAVES 2 28X5 WET B STN
 LAT 49-334N DAY 22 NO.DPTH 12 WND-DIR 280 WW-CODE 02
 LON 64-320W HR 01.7 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARD 997.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
017	0000	042	B	31065	2467	14624
017	0009	0421		30675	2436	14621
017	0019	0421		30679	2436	14623
017	0028	0420		30688	2437	14624
017	0038	0420		30696	2437	14625
017	0047	0415		30765	2443	14626
017	0070	0115		32456	2602	14521
017	0094	0062		32734	2627	14505
017	0141	0210		33501	2679	14590
017	0188	0329		34117	2718	14657
017	0235	0360		34176	2719	14679
017	0282	0406		34442	2736	14710

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0420	B	31065	2467	14624	0000	00000	3285
0010	0421		3067 B	2435	14621	0035	00002	3588
0020	0421		30680	2436	14623	0071	00007	3577
0030	0420		30687	2437	14624	0106	00017	3572
0050	0381	F	3096 I	2462	14614	0176	00045	3328
0075	0089	C	3257 I	2613	14512	0242	00085	1896
0100	0072	C	3283 C	2634	14512	0287	00125	1692
0125	0143	G	3323 F	2662	14553	0326	00170	1429
0150	0237		3365 D	2688	14605	0359	00216	1186
0175	0302		3398 E	2709	14642	0386	00261	0989
0200	0340	B	3415 H	2719	14665	0410	00307	0901
0225	0356	B	3418 G	2720	14676	0433	00356	0896
0250	0390	E	3437 I	2731	14697	0454	00408	0791

C-REF-NO 004 YR 1968 DEPTH 164 WAVES 1 28X4 AIR T-01.1 VIS 6
 CONS. NO 028 MONTH 11 MXSAMPD 01 WAVES 2 28X5 WET 8 STN
 LAT 49-404N DAY 22 NO.DPTH 9 WND-DIR 280 WW-CODE 02
 LON 64-260W HR 03.0 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 998.0 CLD-AMT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
030	0000	041	B	30991	2462	14619
030	0009	0409		30978	2461	14620
030	0018	0409		30975	2461	14621
030	0027	0418		31006	2462	14627
030	0036	0415		31134	2473	14629
030	0045	0201		32147	2571	14551
030	0073	0071		32520	2609	14503
030	0089	0069		32750	2628	14508
030	0134	0156		33158	2655	14560

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0410	B	30991	2462	14619	0000	00000	3331
0010	0409		30977	2461	14620	0034	00002	3342
0020	0411		30976	2460	14622	0067	00007	3345
0030	0429	D	3099 I	2460	14632	0101	00016	3348
0050	0142	H	3237 I	2593	14529	0155	00037	2085
0075	0069		32550	2612	14503	0206	00068	1902
0100	0058	D	3285 D	2637	14506	0251	00108	1667
0125	0116	B	3309 B	2652	14540	0291	00155	1522

C-REF-NO 004 YR 1968 DEPTH 384 WAVES 1 28X4 AIR T 00.0 VIS 7
 CONS. NO 029 MONTH 11 MXSAMPD 03 WAVES 2 28X5 WET B STN
 LAT 49-100N DAY 22 NO.DPTH 12 WND-DIR 280 WW-CODE 70
 LON 63-530W HR 07.1 W-COLOR WND-FCE 06 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1002.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
071	0000	037	B	30944	2462	14601
071	0010	0384		30876	2455	14608
071	0019	0385		30870	2454	14610
071	0028	0385		30877	2455	14611
071	0038	0146		32427	2597	14530
071	0047	0120		32649	2617	14523
071	0071	0084		32913	2640	14514
071	0095	0136		33176	2658	14545
071	0142	0251		33710	2692	14611
071	0189	0346		34137	2718	14665
071	0236	0388		34352	2731	14694
071	0284	0408		34501	2740	14712

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT-EN	SVA
0000	0370	B	30944	2462	14601	0000	00000	3332
0010	0384		30876	2455	14608	0034	00002	3395
0020	0390	B	3084	2451	14612	0068	00007	3430
0030	0338	F	3118	2483	14596	0101	00015	3130
0050	0112		3270	2621	14520	0151	00034	1816
0075	0089		32957	2643	14518	0194	00062	1604
0100	0148		33235	2662	14552	0232	00096	1430
0125	0210		3352	2680	14587	0266	00135	1257
0150	0270		33794	2697	14621	0296	00176	1101
0175	0322		34026	2711	14651	0322	00220	0973
0200	0359		3420	2721	14673	0345	00264	0881
0225	0382		3431	2728	14689	0367	00311	0819
0250	0402	B	3443	2735	14703	0387	00359	0757

C-REF-NO 004 YR 1968 DEPTH 400 WAVES 1 28X3 AIR T 00.0 VIS 7
 CONS. NO 030 MONTH 11 MXSAMPD 02 WAVES 2 28X3 WET B STN
 LAT 48-565N DAY 22 NO.DPTH 11 WND-DIR 280 WW-CODE 02
 LON 63-035W HR 10.9 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1004.0 CLD-ANT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
109	0000	047 B	30861		2445	14642
109	0009	0472	30808		2441	14644
109	0017	0472	30822		2442	14646
109	0025	0475	30826		2442	14648
109	0034	0530	31158		2463	14677
109	0043	0499	31400		2485	14669
109	0064	0110	32330		2592	14516
109	0085	0092	32632		2617	14516
109	0127	0150	33044		2646	14555
109	0170	0251	33490		2675	14612
109	0212	0388	33939		2698	14684

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0470 B	30861		2445	14642	0000	00000	3486
0010	0472	30808		2441	14644	0035	00002	3528
0020	0470	3081 D		2441	14645	0071	00007	3527
0030	0507 C	3100 F		2452	14665	0106	00016	3425
0050	0373 I	3172 I		2523	14621	0168	00041	2753
0075	0075 G	3253 H		2610	14505	0227	00077	1920
0100	0103 B	3279 D		2629	14526	0273	00118	1737
0125	0145	33027		2645	14552	0314	00166	1586
0150	0199	33280		2662	14583	0352	00220	1433
0175	0265	33541		2677	14620	0387	00277	1289
0200	0345	33808		2692	14662	0418	00336	1161

C-REF-NO 004 YR 1968 DEPTH 384 WAVES 1 28X3 AIR T 00.5 VIS 7
 CONS. NO 031 MONTH 11 MXSAMPD 03 WAVES 2 28X3 WET B STN
 LAT 48-434N DAY 22 NO.DPTH 12 WND-DIR 280 WW-CODE 02
 LON 62-195W HR 14.6 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SO 151 C/I 1810 W-TRNSP BARO 1006.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
146	0000	045	B	31824	2524	14647
146	0010	0452		31799	2522	14649
146	0020	0451		31798	2522	14650
146	0030	0451		31793	2521	14652
146	0040	0450		31793	2521	14653
146	0050	0154		32227	2581	14532
146	0074	0070		32615	2617	14504
146	0099	0140		32900	2636	14544
146	0149	0309		33631	2681	14636
146	0198	0413		34116	2709	14695
146	0248	0439		34375	2727	14717
146	0298	0443		34485	2735	14729

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0450	B	31824	2524	14647	0000	00000	2741
0010	0452		31799	2522	14649	0028	00001	2763
0020	0451		31798	2522	14650	0055	00006	2763
0030	0451		31793	2521	14652	0083	00013	2767
0050	0154		32227	2581	14532	0133	00033	2198
0075	0071		32627	2618	14505	0184	00065	1845
0100	0144		32915	2637	14545	0228	00104	1670
0125	0229	B	3328 F	2660	14593	0268	00149	1454
0150	0312		33643	2681	14637	0302	00197	1251
0175	0373		33917	2697	14671	0331	00246	1104
0200	0415		34130	2710	14696	0358	00297	0989
0225	0433		34280	2720	14710	0382	00349	0899
0250	0450	C	3440 C	2728	14722	0403	00402	0831
0300	0442		34485	2735	14728	0444	00515	0762

C-REF-NO 004 YR 1968 DEPTH 53 WAVES 1 23X1 AIR T 03.3 VIS B
 CONS. NO 032 MONTH 11 MXSAMPD 00 WAVES 2 28X2 WET B STN
 LAT 48-200N DAY 22 NO.DPTH 6 WND-DIR 230 WW-CODE 01
 LON 63-100W HR 18.6 W-COLOR WND-FCE 02 CLD-TPE
 MARSD SO 151 C/I 1810 W-TRNSP BARO 1005.0 CLD-ANT 7 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
186	0000	044	B	31031	2462	14632
186	0010	0445		30939	2454	14635
186	0020	0463		31071	2463	14646
186	0030	0462		31209	2474	14649
186	0040	0417		31473	2499	14635
186	0050	0164		32365	2591	14539

*TIME-DISTANCE CHECK FAILED

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0440	B	31031	2462	14632	0000	00000	3329
0010	0445		30939	2454	14635	0034	00002	3404
0020	0463		31071	2463	14646	0068	00007	3322
0030	0462		31209	2474	14649	0101	00015	3218
0050	0164		32365	2591	14539	0154	00036	2100

C-REF-NO 004	YR 1968	DEPTH 78	WAVES 1	17X1	AIR T 02.2	VIS 8
CONS. NO 033	MONTH 11	MXSAMPD 01	WAVES 2	17X1	WET 8	STN
LAT 47-500N	DAY 22	NO.DPTH 7	WND-DIR 170	WW-CODE 02		
LON 62-500W	HR 21.8	W-COLOR	WND-FCE 02	CLD-TPE		
MARSD SQ 151	C/I 1810	W-TRNSP	BARD 1003.0	CLD-AMT 8	HW	

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
218	0000	043	B	31148	2472	14629
218	0010	0431		31107	2469	14631
218	0020	0427		31124	2471	14631
218	0030	0426		31142	2472	14633
218	0040	0416		31259	2482	14632
218	0050	0389		31607	2513	14626
218	0075	0173		32180	2576	14544

#TIME-DISTANCE CHECK FAILED

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0430	B	31148	2472	14629	0000	00000	3231
0010	0431		31107	2469	14631	0033	00002	3264
0020	0427		31124	2471	14631	0065	00007	3248
0030	0426		31142	2472	14633	0098	00015	3234
0050	0389		31607	2513	14626	0159	00040	2850
0075	0173		32180	2576	14544	0223	00080	2246

C-REF-NO 004 YR 1968 DEPTH 60 WAVES 1 11X2 AIR T 02.2 VIS 8
 CONS. NO 034 MONTH 11 MXSAMPD 00 WAVES 2 11X2 WET B STN
 LAT 47-100N DAY 23 NO.DPTH 6 WND-DIR 110 WW-CODE 02
 LON 63-100W HR 02.6 W-COLOR WND-FCE 02 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1000.0 CLD-AMT 8 HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
026	0000	045	B	31071	2464	14637
026	0010	0444		31029	2461	14635
026	0020	0445		31031	2461	14638
026	0030	0445		31032	2462	14639
026	0040	0405		31314	2488	14628
026	0050	0230		31947	2553	14562

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0450	B	31071	2464	14637	0000	00000	3308
0010	0444		31029	2461	14635	0033	00002	3335
0020	0445		31031	2461	14638	0067	00007	3335
0030	0445		31032	2462	14639	0100	00015	3335
0050	0230		31947	2553	14562	0159	00038	2463

C-REF-NO 004 YR 1968 DEPTH 65 WAVES 1 26X2 AIR T 03.3 VIS
 CONS. NO 035 MONTH 11 MXSAMPD 00 WAVES 2 26X2 WET B STN
 LAT 46-45N DAY 23 NO.DPTH 6 WND-DIR 260 WW-CODE
 LON 62-000W HR 07.8 W-COLOR WND-FCE 05 CLD-TPE
 MARSD SQ 151 C/I 1810 W-TRNSP BARO 1000.0 CLD-AMT HW

O B S E R V E D

GMT	DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND
078	0000	046	B	30912	2451	14639
078	0010	0469		30879	2447	14644
078	0020	0469		30884	2447	14646
078	0030	0461		30910	2450	14644
078	0040	0450		30931	2453	14642
078	0050	0358		31388	2498	14610

*TIME-DISTANCE CHECK FAILED

I N T E R P O L A T E D

DEPTH	TEMP	SAL	OXYGEN	SGMT	SOUND	DELTA-D	POT. EN	SVA
0000	0460	B	30912	2451	14639	0000	00000	3438
0010	0469		30879	2447	14644	0035	00002	3472
0020	0469		30884	2447	14646	0070	00007	3469
0030	0461		30910	2450	14644	0104	00016	3442
0050	0358		31388	2498	14610	0169	00042	2988

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7	Davis Strait and Northern Labrador Sea	10-65-001
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